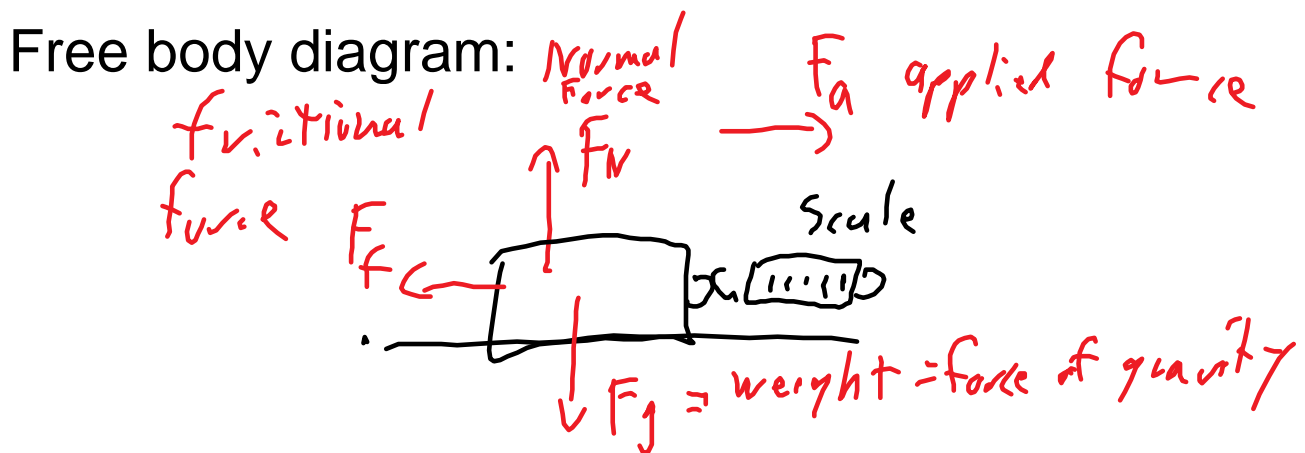


Friction Lab

Name block

Purpose: Determine factors that influence the coefficient of friction, $\mu = F_f / F_N$.

Hypothesis:



if $a = 0$ - constant velocity
 $F_{net} = 0$ Forces are balanced
 $F_N = F_g$ $F_a = F_f$

- Factors to test?

- material
- weight - 1, 2 and 3 blocks
- surface areas
- static, slow, fast

Factor	applied force, $F_a = F_f$ (N)	weight, F_g (N)	$\mu = F_f/F_N = F_a/F_g$ (no units)
one block	0.80	2.8	$0.8/2.8 = 0.29$
two blocks		5.6	

Describe the effect of each factor on friction.

sources of uncertainty

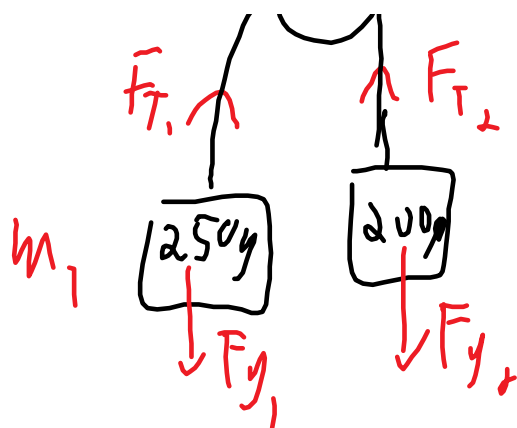
due Monday, Nov 21

Quiz next class

1. You stand on a scale that reads in Newtons, in an elevator. If you are 50.0 kg, what value does the scale read
 - a) when you are at rest at the ground floor?
 - b) when you accelerate up at 2.0 m/s^2 ?
 - c) when you move up at a constant 3.0 m/s ?
 - d) when you slow down at -4.0 m/s^2 .
 - e) when you are at rest at the 10th floor.
 - f) when someone cuts the cable and your elevator falls at -9.80 m/s^2 ?
2. A 200g mass and a 250g mass are suspended over a pulley. Determine the acceleration of the masses and the tension in the connecting cord.



The tension in



The tension in the cord
 $F_{T1} = F_{T2}$

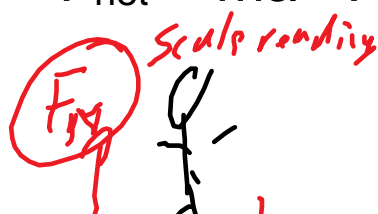
1. You stand on a scale that reads in Newtons, in an elevator. If you are 50.0 kg, what value does the scale read

a) when you are at rest at the ground floor?

$$F_g = mg = 50.0 \text{ kg} \times 9.80 \text{ N/kg} = 50 \times 9.8 = 490.0 \text{ N}$$

b) when you accelerate up at 2.0 m/s^2 ?

$$F_{\text{net}} = ma \quad F_{\text{net}} = \Sigma F = F_N - F_g = ma$$



$$a = 2.0 \text{ m/s}^2$$

$$F_N = ma + F_g$$

$$F_N = 50(2) + 490$$

$$= \boxed{590 \text{ N}}$$

c) when you move up at a constant 3.0 m/s ?

$$a = 0 \quad F_N = F_g = 490 \text{ N}$$

d) when you slow down at -4.0 m/s^2 .

$$F_{\text{net}} = ma = 50 \times -4 = -200 \text{ N}$$

$$F_N = ma + mg = -200 \text{ N} + 490 \text{ N} = 290 \text{ N}$$

e) when you are at rest at the 10th floor.

$$490 \text{ N}$$

f) when someone cuts the cable and your elevator falls at -9.80 m/s^2 ?

scale reads 0 because you are in freefall.

study for quiz p107 Q20, 23, 26, 28